

bodies, i.e., elements presenting a center of less density, and ranging in size from 100 to 150 m μ , can be seen arranged along the strands of the reticulum just mentioned” (p. 238).

Electron microscopy gave Claude, again in collaboration with Porter, an opportunity to return to cancer research by examining tumor cells. Already in the *Annual Report* for 1944–5, they described finding in tumor cells “small granules of uniform size and characterized by a density appreciably greater than that of the surrounding cytoplasm . . . which are certainly not common in normal cells” (p. 73). The next year they conducted studies on Chicken Tumor 1 and Chicken Tumor 10 cells, identifying granules of similar structure that “are readily distinguished from normal cell constituents, especially from microsomes, by their regular granular shape, their relatively uniform size and because of a greater density in osmium preparations” (p. 91). The particles were differently distributed in the two tumor types, with those in Chicken Tumor 10 being clustered in colonies while those of Chicken Tumor 1 were distributed more widely in pairs or in rows of up to six particles. By the time of their published paper in 1947 they were willing to conclude that these particles were the causative agent of the respective tumors (Claude et al., 1947). At the end of the paper they speculated that the particles replicate by division and noted that the variation in size of the particles was compatible with their growing larger prior to such splitting and yielding smaller particles after the split.

After their joint investigation of cancer cells, Porter and Claude went in their own directions. Claude directed his attention to developing a technique for thinly sectioning cells while Porter continued to develop the technique for studying cultured cells and understanding the “lace-like reticulum” found in them. Already in the *Annual Report* for 1945–6 he had become more definite about the relation between granules and the lace-like reticulum of the endoplasm:

Possibly the most important discovery from these studies is that in relation to the endoplasm. This cell system has been heretofore unobservable & only dark field illumination has provided any hint of its existence. As seen in osmium-fixed preparations under the electron microscope, it appears as a finely divided reticulum along the strands of which are scattered tiny bodies 60 to 100 m μ in diameter. The particulate components are believed to be the same as those isolated by high-speed centrifugation and known as microsomes. This endoplasm

of stretching as much as required in thin-spreading tissue-cultured cells, it was embedded in something that did stretch. It was not just suspended in the cytoplasm, because otherwise it would not be stretched but, rather, would remain in the middle.